



# BAYER SOLUTIONS

## Summer Decline Solutions

### **The Problem:**

The decline in turf quality and growth of creeping bentgrass and annual bluegrass is a major problem on putting greens during the summer months. Both biotic (diseases) and abiotic stresses (high temperature, high relative humidity, excessive soil moisture, poor air movement) may be contributing factors to the severity of summer decline. Pathogens such as *Colletotrichum cereale* (anthracnose), *Rhizoctonia* spp. and *Pythium* spp. can play a role in summer decline by attacking stressed turf. Due to the complexity of summer decline, specific causes are not well understood. Previous research by Dr. Bingru Huang at Rutgers University found that heat stress is a primary factor contributing to weakened turf during the summer (Golf Course Management 69(7):661-61).

### **What to Look for:**

Optimum air temperature for shoot growth for cool-season grasses is 15-24°C and optimum soil temperature for root growth is 13-17°C. Shoot growth ceases when air temperature is above 32°C and root growth ceases when soil temperature is above 25°C. These temperatures are often exceeded on creeping bentgrass and annual bluegrass putting greens during the summer. The high temperatures cause the roots of cool-season grasses to decline and the growth of new roots to be inhibited. The declining roots are more susceptible to root rotting fungi and other stresses, while the new roots do not grow to replace the old roots. Summer decline symptoms can include poor turfgrass vigour, chlorotic turf, reduced density, diminished root system, disease activity, and overall inferior turf quality.

### **Bayer Solutions:**

Implementing proper cultural practices is crucial to alleviating turf stress during the summer. Management tactics that encourage root growth will help to reduce the damage including: aerifying throughout the summer with needle tines or spikers, syringing to lower canopy temperature, improving air movement by removing trees or using fans around the greens, spoon feeding with water soluble nutrients, and raising mowing heights to increase photosynthetic activity.

A preventive fungicide program has been shown to be very helpful in managing summer decline. Fungicide applications should be initiated in late-spring/early-summer prior to the onset of summer stress and continued throughout the summer months. Signature Stressgard™ provides plant health effects and should be tank mixed with other fungicides to control both biotic and abiotic factors that contribute to summer decline.

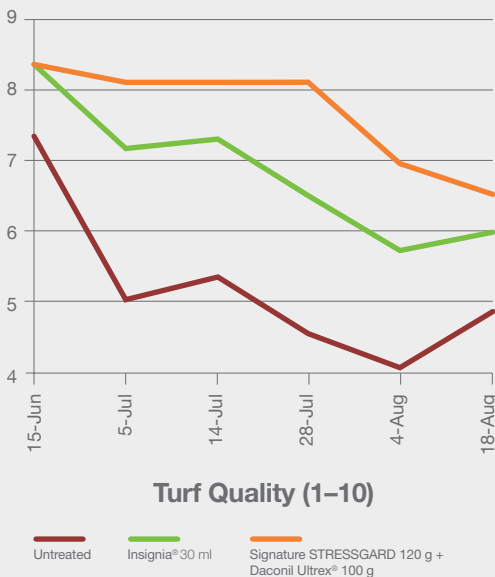
# Summer Decline Solutions

| SOLUTION                                    | RATE (PER 100 M <sup>2</sup> ) | APPLICATION INTERVAL* |
|---|--------------------------------|-----------------------|
| Signature Stressgard + Daconil Ultrex®      | 120 - 200 g + 100 g            | 14 days               |
| Signature Stressgard + Interface Stressgard | 120 - 200 g + 95-160 mL        | 14 - 28 days          |
| Signature Stressgard + Mirage Stressgard    | 120 - 200 g + 32 - 64 mL       | 14 - 21 days          |
| Signature Stressgard + Exteris Stressgard   | 120 - 200 g + 140 - 200 mL     | 14 - 21 days          |

\*See fungicide labels for complete details. Always read and follow label instructions carefully.

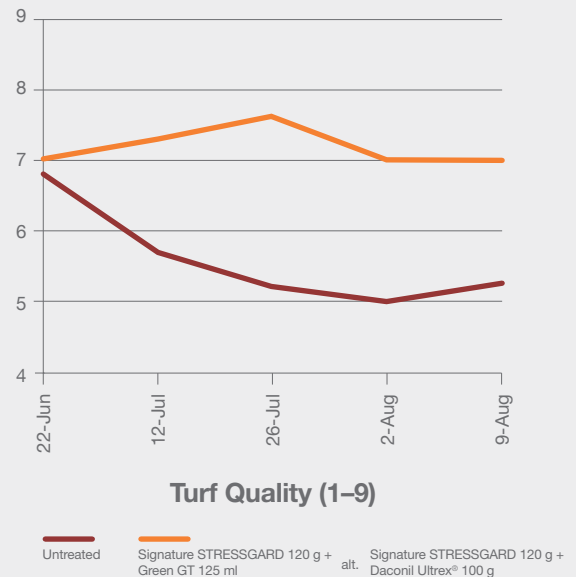
## Research Data:

### 2006 University of Maryland Summer Turf Quality, Dr. Peter Dernoeden



Treatments applied on June 5, June 19, July 3, and July 17 to creeping bentgrass. Turf quality rated 1-10 with 10 = best. Golf Course Management, 76(4):102-106.

### 2011 University of Kentucky Summer Turf Quality, Dr. Paul Vincelli



Treatments initiated May 24 and final application Aug 2. Turf quality rated 1-9 with 9 = best. All treatments applied on a 2 week interval. Plant Disease Management Reports 6:T013